

WHAT IS CLAIMED IS:

1. A semiconductor device for transmitting information by using an induction field as a transmission medium, comprising:
  - 5 an IC chip for storing and processing information to be transmitted;
  - a coil for generating the induction field; and connecting terminals provided at an end of the coil and electrically connected to the IC chip,
- 10 wherein the coil and the connecting terminals are formed of the same metal plate that is patterned.
2. The semiconductor device according to claim 1, wherein the IC chip, the coil, and the connecting terminals are encapsulated with a resin to be integrated with one another.
- 15 3. The semiconductor device according to claim 2, wherein at least one side of the coil is exposed from a surface of the resin.
- 20 4. The semiconductor device according to claim 2, wherein the IC chip and the connecting terminals are connected by wires, and wherein the wires are encapsulated with the resin.
- 25 5. The semiconductor device according to claim

2, wherein the IC chip and the connecting terminals are connected in flip chip connection.

6. The semiconductor device according to claim  
5 2, wherein a part of one side of the coil is bonded and fixed with a tape.

7. A semiconductor device for transmitting information by using an induction field as a  
10 transmission medium, comprising:

an IC chip for storing and processing information to be transmitted;  
an IC chip supporting section for mounting the IC chip thereon;

15 a coil for generating the induction field; and connecting terminals provided at an end of the coil and electrically connected to the IC chip,  
wherein the IC chip supporting section, the coil, and the connecting terminals are formed of the  
20 same metal plate that is patterned.

8. The semiconductor device according to claim  
7, wherein the IC chip, the IC chip supporting section, the coil, and the connecting terminals are  
25 encapsulated with a resin to be integrated with one another.

9. A method of producing a semiconductor device that transmits information by using as a transmission medium an induction field generated from a coil electrically connected to an IC chip.
- 5 comprising the steps of:
- preparing one sheet of metal plate;
- forming a metal frame having at least a coil pattern and a connecting terminal pattern formed at an end of the coil pattern, by patterning the metal
- 10 plate;
- mounting the IC chip on the metal frame;
- electrically connecting the connecting terminal pattern to the IC chip; and
- encapsulating the IC chip and the metal frame
- 15 with a resin to integrate them.

10. The method of producing a semiconductor device according to claim 9, wherein the patterning of the metal plate is performed by stamping or

20 etching.

11. The method of producing a semiconductor device according to claim 9, wherein electric connection of the connecting terminal pattern and the

25 IC chip is performed by wire bonding, and wherein wires formed by the wire bonding are encapsulated with the resin.

12. The method of producing a semiconductor device according to claim 9, wherein electric connection of the connecting terminal pattern and the IC chip is performed in flip chip connection.

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13. The method of producing a semiconductor device according to claim 9, further comprising a step of sticking a tape for coil pattern fixation on a part of one side of the coil pattern after the 10 connecting terminal pattern and the IC chip are electrically connected.

14. A method of producing a semiconductor device that transmits information by using as a 15 transmission medium an induction field generated from a coil electrically connected to an IC chip, comprising the steps of:

preparing one sheet of metal plate;  
forming a metal frame having at least a coil 20 pattern, a connecting terminal pattern formed at an end of the coil pattern, and a tying section tying respective portions of the coil pattern, by patterning the metal plate;

mounting the IC chip on the metal frame;  
25 electrically connecting the connecting terminal pattern to the IC chip;

sticking a tape for coil pattern fixation on a

part of one side of the coil pattern after the connecting terminal pattern and the IC chip are electrically connected;

cutting the tying section; and

- 5 encapsulating the IC chip and the metal frame with a resin to integrate them.

15. A method of producing a semiconductor device that transmits information by using as a  
10 transmission medium an induction field generated from a coil electrically connected to an IC chip, comprising the steps of:

preparing one sheet of metal plate;

- 15 forming a metal frame having at least a coil pattern, a connecting terminal pattern formed at an end of the coil pattern, an outer frame section, and tying sections tying respective portions of the coil pattern and tying the coil pattern and the outer frame section, by patterning the metal plate;

- 20 mounting the IC chip on the metal frame; electrically connecting the connecting terminal pattern to the IC chip;

- 25 sticking a tape for coil pattern fixation on a part of one side of the coil pattern after the connecting terminal pattern and the IC chip are electrically connected;

cutting the tying section tying respective

portions of the coil pattern;  
encapsulating the IC chip and the metal frame  
with a resin to integrate them; and  
cutting the tying section tying the coil  
5 pattern and the outer frame section.

16. The method of producing a semiconductor device according to claim 15, wherein a plurality of semiconductor devices is produced from the one sheet  
10 of the metal plate.

17. A method of producing a semiconductor device that transmits information by using as a transmission medium an induction field generated from  
15 a coil electrically connected to an IC chip,  
comprising the steps of:

preparing a metal plate;  
forming a metal frame having at least the IC chip supporting section pattern on which an IC chip  
20 is mounted, a coil pattern, and a connecting terminal pattern formed at an end of the coil pattern, by patterning the metal plate;  
mounting the IC chip on the IC chip supporting section;  
25 electrically connecting the connecting terminal pattern to the IC chip; and  
encapsulating the IC chip and the metal frame

with a resin.

18. An electrophotographic apparatus on which  
a detachable process cartridge is mounted,  
5 comprising:

a semiconductor device including an IC chip for  
storing and processing information to be transmitted,  
a coil for generating an induction field, and  
connecting terminals provided at an end of the coil  
10 and electrically connected to the IC chip, the coil  
and the connecting terminal being formed of the same  
metal plate that is patterned;

the process cartridge on which the  
semiconductor device is stuck; and

15 a transmission-reception unit for receiving  
information from and transmitting information to the  
semiconductor device.